United States Enrichment Corporation (USEC)
Air Emissions Annual Report
(Under Subpart H, 40 CFR 61.94)
Calendar Year 2003

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SECTION 1.0 FACILITY INFORMATION

1.1 Site Description

The Portsmouth Gaseous Diffusion Plant (PORTS) is owned by the Department of Energy (DOE). PORTS was operated by DOE until July 1, 1993. In 1992, Congress passed legislation amending the Atomic Energy Act of 1954 (the Act) to create the United States Enrichment Corporation, a government corporation, to operate the uranium enrichment enterprise in the United States. The government corporation began operation on July 1, 1993. In accordance with the Act, the United States Enrichment Corporation leased the production facilities at PORTS and its sister plant at Paducah, Kentucky from DOE. DOE retained operational control of most waste storage and handling facilities as well as all sites undergoing environmental restoration. In keeping with the Act, on July 28, 1998, the U.S. Department of the Treasury sold the uranium enrichment enterprise through an Initial Public Offering (IPO). USEC, Inc. officially became a private corporation on that date. The Portsmouth and Paducah gaseous diffusion plants are operated by a subsidiary of USEC, Inc., the United States Enrichment Corporation (USEC). In May 2001, USEC ceased uranium enrichment operations at PORTS. USEC continues to operate transfer facilities and certain support facilities at PORTS for the purpose of removing technetium (Tc) from off-specification uranium hexafluoride (UF_6) feed material. USEC also continues to maintain the enrichment cascade in a standby condition under contract to DOE.

The PORTS site is located in sparsely populated, rural Pike County, Ohio, on a 16.2-km^2 (6.3-$mile^2$) site about 1.6 km (1 mile) east of the Scioto River Valley at an elevation of approximately 36.6 m (120 ft) above the Scioto River floodplain. The terrain surrounding the plant, except for the Scioto River floodplain, consists of marginal farmland and densely forested hills. The Scioto River floodplain is farmed extensively, particularly with grain crops such as corn and soybeans.

Pike County has a generally moderate climate. Winters in Pike County are moderately cold, and summers are moderately warm and humid. The precipitation is usually well distributed with fall being the driest season. Prevailing winds at the site are out of the southwest to south. Average wind speeds are about 5 mph (8 km/h) although winds of up to 75 mph (121 km/h) have been recorded at the plantsite. Usually, high winds are associated with thunderstorms that occur in spring and summer. Southern Ohio lies within the Midwestern tornado belt, although no tornados have struck the plantsite to date.

Pike County has approximately 27,695 residents (2000 census data). Scattered rural development is typical; however, the county contains numerous small villages such as Piketon, Wakefield, and Jasper, which lie within a few kilometers of the plant. The county's largest community, Waverly, is about 19 km (12 miles) north of the plantsite and has a population of approximately 4,433 residents. Additional population centers within 80 km (50 miles) of the plant are Portsmouth (population 20,909), Chillicothe (population 21,796), and Jackson (population 6,184). The total population of the area lying within an 80-km (50-mile) radius of the plant is approximately 669,000.

USEC is responsible for the principal site process and support operations. Until May 2001, the principal site process was the separation of uranium isotopes through gaseous diffusion. From then until June 2002, the principal site process was quality control sampling, packaging and shipping of uranium enriched elsewhere. A normal part of the packaging process was the removal of residual technetium-99 (^{99}Tc) with chemical absorbents. In June 2002, the transfer and sampling facilities were dedicated to removing ^{99}Tc from UF_6 feedstock prior to enrichment. In addition, USEC is continuing to decontaminate some of the enrichment equipment in situ and is maintaining the gaseous diffusion process equipment in "cold standby" under contract to the DOE.

Support operations include the withdrawal of material from the decontaminated process equipment, treatment of water for both potable and cooling purposes, steam generation for heating purposes, decontamination of equipment either in situ or removed from the process, recovery of uranium from various waste materials, and treatment of industrial wastes generated onsite. DOE is responsible for operations such as the X-326 "L-Cage" and its glove box, the X-345 High Assay Sampling Area (HASA), and site remediation activities. Because of the separation of responsibilities, DOE and USEC are submitting separate annual NESHAP reports and are certifying only those activities for which they have direct responsibility. The following section is a description of USEC's emissions sources.

1.2 Source Description

1.2.1 Radionuclides Used at the Facility

As discussed above, the principal site process was the separation of uranium isotopes as UF_6 until May 2001 and is the sampling and handling of UF_6. Large quantities of UF_6 are located on the site. From May 2001 until June 2002, UF_6 enriched in the ^{235}U isotope was received from the Paducah Gaseous Diffusion Plant located in Paducah, Kentucky for quality control sampling, transfer into customer-owned containers and shipment to customers. Since June 2002, unenriched UF_6 from both the Paducah and PORTS stockpiles has been sampled, filtered and re-packaged for USEC's own use. The UF_6 contains trace quantities of other radionuclides introduced from DOE's practice during the years 1953 to 1975 of intermittently feeding reprocessed reactor fuel from government reactors in addition to unused UF_6. In particular, concentrations of ^{99}Tc in this material exceed the ASTM standard for nuclear fuel. PORTS is using chemical absorbents to remove the ^{99}Tc from liquid UF_6. PORTS has also detected occasional traces of various thorium isotopes in the process equipment.

In May 2001, USEC ceased enrichment operations at the Portsmouth GDP. Since then, the enrichment cascade has been in "Cold Standby". USEC is under contract to DOE to maintain the PORTS enrichment cascade in a condition that will allow it to be re-started within 24 months if needed. In addition, some of the equipment is being operated for in situ decontamination.

PORTS also uses a variety of sealed sources for calibration of equipment; however, none of these are released and therefore are not used in the determination of the effective dose equivalent (EDE). Column 1of Table 2.3 lists the radionuclides used in the determination of the EDE.

1.2.2 Monitored and Unmonitored Sources

The sources discussed in this section are the significant or potentially significant contributors to airborne radionuclide emissions from USEC operations.

PORTS reviewed the radiological emission sources on the plantsite and determined that fifteen had the greatest potential for emissions and equipped them with continuous emissions samplers (see Table 1.0). All fifteen are sampled continuously when operating by flow-proportional, isokinetic samplers to provide emissions data. Six of these sources (the purge cascades, the cold recovery systems, and the building wet air evacuation systems) are also monitored in real-time by ionization chamber instruments for operational control. Two of these sources (the X-343 and X-344 cold trap vents) are monitored in real-time by gamma detectors mounted on the continuous emission samplers for the same purpose. Laboratory analysis of the emissions samples is more sensitive, more accurate, and more reliable than either the ionization chambers or the gamma detectors but cannot provide real-time data required for process control.

Table 1.0 PORTS Monitored Emission Points

Location	Vent Identification Number
X-326 Top Purge Vent	X-326-P-2799
X-326 Side Purge Vent	X-326-P-2798
X-326 Emergency Jet Vent	X-326-P-616
X-326 Seal Exhaust Vent 6	X-326-A-540
X-326 Seal Exhaust Vent 5	X-326-A-528
X-326 Seal Exhaust Vent 4	X-326-A-512
X-330 Seal Exhaust Vent 3	X-330-A-279
X-330 Seal Exhaust Vent 2	X-330-A-262
X-333 Seal Exhaust Vent 1	X-333-A-851
X-330 Cold Recovery/Building Wet Air Evacuation Vent	X-330-A-272
X-333 Cold Recovery Vent	X-333-P-852
X-333 Building Wet Air Evacuation Vent	X-333-P-856
X-343 Cold Trap Vent	X-343-P-468
X-344 Gulper Vent	X-344-P-929
X-344 Cold Trap Vent	X-344-P-469

1.2.2.1 Monitored Sources

Top and Side Purge Cascades

The two purge cascades continuously separate light gases from process gas (UF_6) using gaseous diffusion. The separated process gas is returned to the main cascade from the tail of the purge cascades. The light gases are split at the head of the purge cascades with enough "lights" being recycled to the main cascade to maintain normal operating flows and the balance being vented through chemical adsorbent traps to the atmosphere. The Side Purge Cascade and Top Purge Cascade operate in series at the very head of the main cascade. For operational control, each of the two purge cascades is monitored separately with real-time instruments called "space recorders".

Operation of the purge cascades is required for continued operation of the main process cascade. Consequently, the two purge cascades are exhausted by three interconnected air jet eductors. The third eductor (Emergency Jet or E-Jet) is an operating spare for either or both regular eductors. The eductors are interconnected to a set of four exhaust pipes. The pipes extend up a 50-meter freestanding tower to remove the emissions from the X-326 Process Building's wind wake. For compliance purposes, each of the three eductors is fitted with separate continuous samplers.

The Top Purge Cascade continues to operate to support the in-situ decontamination activities mentioned above. The Side Purge Cascade is in standby with its associated eductor valved off. The Side Purge Cascade will eventually be restarted for decontamination of its own equipment. The E-Jet has continued to operate as needed, but has been needed only occasionally since May 2002. Both purge cascades and all three eductors remain available for use if needed.

Seal Exhaust Stations

The seal exhaust (SE) stations maintain a vacuum within cascade compressor shaft seals to prevent inleakage of wet air to the cascade. This vacuum is isolated from the compressor side of the seal by a buffer zone. Gases evacuated from the seals are pulled through chemical adsorbent traps by a bank of manifolded vacuum pumps and exhausted to the atmosphere through mist eliminators (for pump oil) and a roof vent. There is one seal exhaust station in each of the cascade's six "areas", each being located adjacent to an area control room (ACR).

As of the end of 2003, two of the seal exhaust stations (Areas 1 and 2) have been shut down. The rest of the seal exhaust stations continue to operate to support the in-situ decontamination activities. All of the seal exhaust stations are available for use if needed.

Cold Recovery Systems

The cold recovery systems are intermittently operated maintenance support systems used to prepare cascade equipment (cells) for internal maintenance. Process gas in cascade cells scheduled for maintenance is first evacuated to adjacent cascade cells to the extent practical. The cell is then sealed off and alternately purged with dry nitrogen and evacuated to the Cold Recovery System. The evacuated gases pass through chilled cylinders called "cold traps" to solidify any residual process gas.

The non-condensable nitrogen carrier is passed through chemical adsorbents for polishing and then is vented by an air jet eductor to the atmosphere. Periodically, individual cold traps are valved off from the vent, and the trapped UF_6 is returned to the cascade by vaporization. There are two cold recovery systems operated at PORTS with one each in the X-330 and X-333 Process Buildings. In X-330, the cold recovery system shares a common vent and vent sampler with the building wet air evacuation system.

Only the X-330 Cold Recovery System continues to operate to support the in-situ decontamination activities. Both of the Cold Recovery Systems are available for use if needed.

Building Wet Air Evacuation Systems

The building wet air evacuation systems are intermittently operated maintenance support systems used to prepare off-line cascade cells for return to service. The cell is sealed off and alternately purged with dry nitrogen and evacuated to remove all outside air and moisture from the cell. The evacuated gases are passed through chemical adsorbents to catch residual radionuclides (if any) and vented to the atmosphere by an air jet eductor. There are two building wet air evacuation systems, one associated with each of the cold recovery systems described above. In X-330, the cold recovery and building wet air evacuation systems share a common vent and sampler.

Only the X-330 Building Wet Air Evacuation System continues to operate to support the in-situ decontamination activities. This system shares a common vent with the X-330 Cold Recovery System. Both of the Building Wet Air Evacuation Systems are available for use if needed.

X-343 and X-344 Cold Trap Areas

Under PORTS' historic configuration, autoclaves in the X-343 facility vaporized UF_6 in 14-ton cylinders to provide feed material for the enrichment cascade. Autoclaves in the X-344 facility liquefied enriched UF_6 in 14-ton or 10-ton cylinders for quality control sampling and transfer to 2.5-ton cylinders for shipment to customers. Residual gases evacuated from the autoclave process piping were returned to the cascade.

When enrichment operations ceased in 2001, the X-343 and X-344 facilities became the sampling and packaging facilities for UF_6 enriched at the Paducah GDP. This process included filtering the liquid UF_6 through chemical absorbents ("tech traps") to remove residual ^{99}Tc. In June 2002, all enriched material handling was consolidated at the Paducah GDP and the X-343 and X-344 facilities were dedicated to filtering ^{99}Tc from out-of-specification UF_6 feedstock before it is enriched at the Paducah GDP. This operation continued through 2003.

A second routine part of the sampling and packaging operation was the replacement and testing of damaged or otherwise out-of-specification valves on the UF_6 cylinders. As the tech removal project has progressed, the number of valves needing replacement has increased and the X-343 was dedicated to replacement and testing of cylinder valves in July 2003.

To deal with the residual gases without an operating enrichment cascade, cold trap systems similar to those in the cascade cold recovery areas were refurbished and upgraded in both facilities. (The cold trap systems were part of the original design of both facilities, but were taken out of service since the piping evacuation systems were redirected back to the cascade.) As part of the upgrades, both systems received new continuous vent samplers based on the continuous vent samplers used on other vents at PORTS. The new samplers are equipped with radiation monitors to track the accumulation of radioactive material in the sampler traps in real-time. This replaces the 1950's-style "space recorders" used for operational control of the other monitored vents at PORTS.

X-344A Manifold Evacuation/Gulper

The X-344A Toll Transfer Facility contains an automated sampling and transfer system for sampling the product and for filling customer cylinders with low assay UF_6. The term "assay" refers to the concentration of ^{235}U in weight percent. To avoid cross contamination between samples and to prevent emissions to the air, the sampling and transfer manifold was formerly evacuated back to the diffusion cascade through a line to the X-342 Feed Vaporization and Fluorine Generation Building and, since May 2001, to the X-344 Cold Trap System. In the event of a trace release occurring in spite of the purge and evacuation procedure, a "gulper" is mounted behind the manifold-to-cylinder connections. The gulper is simply a continuous vacuum nozzle, similar in principal to a lab hood, which draws any small releases from the room air into a filtration system. The filtration system has two filter banks, each consisting of a roughing filter followed by high efficiency particulate air (HEPA) filters and a centrifugal blower.

1.2.2.2 Unmonitored and Potential Sources

PORTS has several unmonitored minor and potential emission sources associated with USEC process support activities. Based on process knowledge and historical ambient monitoring data, none of these sources are believed to contribute significantly (i.e. in excess of 1% of the USEPA standard) to plant radionuclide emissions under normal operations.

The minor sources, as the term is used at PORTS, have some trace radionuclides in their routine emissions but only in negligible amounts under normal operating conditions. The potential sources are primarily room ventilation exhausts and/or pressure relief vents from areas that have a potential for an internal radionuclide release.

Since 1995, PORTS has included emissions estimates from unmonitored sources in the calculation of the EDE. As required by NESHAP regulations, these estimates were updated for the 2000 and later calculations.

X-705 Decontamination Facility

Equipment that is removed from the PORTS cascade is sealed at the point of removal and transported to the X-705 Decontamination Facility. Small parts are cleaned in "hand tables" or spray tanks, while large parts are sent through an automated "tunnel." The hand tables consist of shallow acid baths (either nitric or citric depending on the metal to be cleaned) where metal parts are decontaminated by passive soaking. The hand tables have fume hoods over them to protect workers from acid fumes. The spray tanks are enclosed tanks where equipment can be cleaned remotely. Pressure relief vents are standard on such equipment. The tunnel is an enclosed series of "booths" that decontaminate large parts by spraying with decontamination solutions (acids and water rinses) as a small rail car carries the parts through the tunnel. The tunnel is ventilated to prevent a buildup of acid fumes. In all cases, radionuclides (uranium and technetium) are dissolved in the liquid phase and collected for recovery of the uranium. None of the radionuclides are volatilized through normal operation of these facilities and only trace radionuclides carried by entrained droplets would be expected.

The X-705 facility has seen minimal use since the end of enrichment operations, but is still available for use. Consequently, USEC continues to include the estimated emissions in its source term.

X-705 Calciners

Decontamination solutions are treated to yield a concentrated aqueous solution of uranyl nitrate, which is converted into uranium oxide powder in one of three calciners located in the X-705 Decontamination Facility. A calciner consists of an inclined heated tube with the uranyl nitrate solution entering at the top and air entering at the bottom. The uranium is first dried and then oxidized as it passes down the tube. The uranium oxide powder is collected directly into a five-inch diameter storage can at the lower end of the calciner tube. The gaseous stream leaves the upper end of the calciner and is exhausted through a scrubber for NO_x control. Uranium is recovered from the spent scrubber solution through a microfiltration process and the effluent is discharged to a National Pollutant Discharge Elimination System permitted outfall. Turbulence and flow rates through the calciners are controlled to minimize blowback of the uranium oxide. Any blowback that does occur is entrapped by the entering uranium solution.

The calciners have seen minimal use since the end of enrichment operations, but are still available for use. Consequently, USEC continues to include the estimated emissions in its source term.

X-705 Glove Boxes

The five-inch can that collects the uranium oxide powder from each calciner is housed in a glove box to prevent the loss of the material. In addition, there is a separate glove box which is used for sampling the material in the can. The glove boxes have air locks for the entry and removal of work materials and are maintained under negative pressure during use. This negative pressure is produced by an exhaust fan drawing through a HEPA filter.

Like the calciners, the gloveboxes have seen minimal use since the end of enrichment operations, but are still available for use. Consequently, USEC continues to include the estimated emissions in its source term.

X-705 Storage Tank Vents

Uranium-bearing solutions awaiting treatment are stored in a manifold of five-inch diameter tanks inside the X-705 facility. All of these tanks are manifolded to a common pressure relief vent that has some potential to release radionuclides if the tanks are overfilled or overheated. Normal emissions should be zero since the stored liquids are quiescent, the dissolved radionuclides are non-volatile, and the vents are not open except during filling.

Emissions estimates from sources in the X-705 Decontamination Facility are included in the EDE calculations. Emissions from X-705 were modeled as a single source. The emissions from X-705 were estimated using the factors given in the Code of Federal Regulations, Title 40, Part 61, Appendix D, and are extremely conservative.

Laboratory Fume Hoods

Laboratory analysis of process and other samples is performed in the PORTS on-site laboratory in accordance with standard laboratory practices. There are no emissions controls on the lab hoods used in these procedures. The hoods should not exhibit any measurable radionuclide emissions during normal operation. Small amounts of technetium are partially volatilized by the analytical method approved by the Environmental Protection Agency under the Safe Drinking Water Act. There is also a possibility of a UF_6 sample container bursting during processing. This is an extremely rare occurrence, however, and cannot be regarded as normal operation as specified in the NESHAP regulations. Most laboratory fume hoods are located in the X-710 Laboratory. There are two fume hoods in the X-760 Chemical Engineering Building which operates as an adjunct to the X-710 Laboratory. These hoods were formerly used to prepare environmental samples such as soil, water, air, and vegetation samples for analysis in the X-710 Laboratory. The level of radionuclides in these samples is extremely low as evidenced by the analytical results. The X-705 Decontamination Facility has a small laboratory which contains three fume hoods which are used to prepare samples and analyze materials being processed in the building.

Emissions from the X-710 Laboratory were estimated using the 40 CFR 61 Appendix D method. These estimates were included in the source term for the dose modeling using CAP88. The emissions from the X-710 were modeled as a single source.

The X-710 Laboratory has a Radioactive Material License from the State of Ohio and now expects to start accepting this work in 2004.

XT-847 Glove Box

The XT-847 Glove Box is a large stainless steel glove box which is used to batch small quantities of radioactively contaminated waste for more efficient and less costly storage, shipment, and disposal. The glove box is used primarily to batch spent alumina and other adsorbents used in control traps on process vents. When the adsorbent is removed from use, it is placed in a safe geometry container (5", 8" or 12" diameter, depending on assay). The material is then analyzed, and if the assay meets nuclear criticality safety limits, it is batched into larger containers including, but not limited to, 55 gallon drums. Other radiological materials may also be handled in the glove box.

Room Air Exhausts

Several uranium handling areas within the plant buildings have some potential for releasing minute ($\leq$1 gram) amounts of UF_6 into the room air. Releases of this size are characterized as small releases (visually resembling a puff of cigarette smoke). However, it should not be implied that any size release is acceptable or overlooked by PORTS. Studies conducted in the early 1980s demonstrated that a release of one gram of UF_6 produces a much larger release (smoke cloud) than what is normally observed during the operations discussed here. Ventilation exhausts from, and worker protection within these areas, are controlled according to the probability of releases occurring. Standard policy in the event of a release is to evacuate the area and remotely close down the local ventilation for confinement and subsequent decontamination.

Material feed and withdrawal areas occasionally have small releases when disconnecting UF_6 containers from process piping. These areas include the X-342A Feed and Fluorine Generation Facility, the X-343 Feed Facility, the X-344A Toll Transfer Facility, the X-330 Tails Withdrawal Area, the X-333 Low Assay Withdrawal Area, and the X-326 Extended Range Product and X-326 Product Withdrawal Areas. These areas have dedicated ventilation exhausts for worker protection but no emission controls or continuous vent monitors (except at the X-344A Toll Transfer Facility). The plant's Health Physics (HP) Department samples the air inside these areas for worker protection. The HP data indicates the average radionuclide concentrations inside the room are typically equivalent to natural background and, based on this, emissions from the room can be presumed to be environmentally insignificant.

The highest probability of internal releases besides the X-344A Sampling/Transfer Area, which was discussed in the previous section, is in the X-705 Decontamination Facility South Annex, where contaminated equipment is unsealed and disassembled. The South Annex has a separate HEPA filtered ventilation system and operates as a sealed area. Supplied air respirators are mandated for worker protection within the annex when the facility is in use. Normal emissions to the outside air should be negligible, which is consistent with past ambient monitoring performed by the plant's HP Department. The main operation in the South Annex during 2003 was the processing of spent technetium filters from the X-344. The filter media (a granular solid) is transferred from the filter itself to small NRC-approved containers by a HEPA filtered vacuum. This particular operation is new to PORTS and the additional emissions have been estimated based on the weight of filter media processed in 2003, laboratory analyses of filter media samples, and methods from 40 CFR 61 Appendix D.

The "cell floors" of the process buildings are subject to a lesser potential for unplanned releases when cascade components are being serviced or removed. Special worker protection ventilation systems for the cell floors are not considered necessary for several reasons, including the huge volume of air passing through the general ventilation systems (approximately 4,000 process motors are air-cooled by the general ventilation system) and the lower potential for a release. The cell floor air is sampled by the HP Department. The same results found in the material withdrawal areas are seen on the cell floor. Routine emissions levels from process building ventilation should be equal to natural background levels.

SECTION 2.0 AIR EMISSIONS DATA

Table 2.0 and Table 2.1 summarize the control device information for each source and give the distance and direction from each source to the nearest resident, school, office or business, and vegetable, meat, and milk-producing farms.

2.1 Radionuclide Emissions from Point Sources

The CAP88 model allows up to six sources to be modeled at one time, but assumes that all sources are located at the origin of the same circular grid. PORTS modeled its emissions as three co-located stacks sited at the actual location of the predominant source, the X-326 Tall Stack, up to 1995. From 1995 through 1997, USEC modeled its emissions from PORTS as nine individual release points at nine different locations to ensure that the impact of estimated emissions from grouped sources close to the downwind site boundary was not underestimated. This required nine different model runs that had to be combined manually, however.

In 1998, after consultation with USEPA-Region 5, the nine sources were re-grouped into three source groups. At that time, the source terms from the lesser sources in each group were typically an order of magnitude lower than the source term from the predominant source in that same group. In 2000, a tenth source (the XT-847 Glove Box Exhaust) was added to the list. In 2001, two more sources were added (the Cold Trap Vents in X-343 and X-344). Since then, the source groups have been re-organized, based on changing emission levels. See Table 2.2 for a description of the emission points for each modeled source.

Group 1 now includes the X-326 Stack, all other X-326 vents, all X-710 Laboratory vents and the XT-847 Glove Box Exhaust; these sources were modeled from the location of the X-326 Stack. Group 2 includes only the two X-344 vents; modeled from the location of X-344 Cold Trap Vent. Group 3 includes the X-330, X-333, X-343, X-700, X-705, and X-720 building vents; modeled from the middle of the X-705 Building.

The individual source terms and stack characteristics for each of the twelve sources are provided in Table 2.3 and Table 3.0 of this report.

2.2 Radionuclide Emissions from Fugitive and Diffuse Sources

There were no significant emissions of radionuclides from diffuse or fugitive sources at PORTS due to USEC operations.

PORTS maintains a network of ambient air monitors around the plantsite which continuously sample for particulate radionuclides. In June of 1995, DOE formally transferred ownership and operational control of the ambient air monitoring network to USEC. On October 1, 2000, USEC returned ownership and control of the ambient air monitoring network to DOE, which upgraded the samplers and uses them in their own public dose assessment program.

Table 2.0 Point Sources

Point Source[a]	Control Device	Control Efficiency	Distance in Meters to the Nearest:					
			Resident	School	Office or Business	Farm		
						Milk	Meat	Veg.
X-326 Top Purge, Side Purge & E-jet (Cascades) (3 monitors)[b]	Chemical Adsorbents	0-95%[c]	1370 SE	5000 NNW	1520 SSE	4290 N	1370 E	8660 ENE
X-330 Cold Recovery/Wet Air Evacuation Vent	Cold Traps Chemical Adsorbents	90-95%[d] 0-95%[c]	1690 ESE	3930 NNW	1370 W	3200 N	1520 ESE, W	8380 ENE
X-333 Cold Recovery Vent	Cold Traps Chemical Adsorbents	90-95%[d] 0-95%[c]	1330 ESE	3840 NNW	1860 WSW	2960 N	1230 SE	7890 ENE
X-333 Wet Air Evacuation Vent	Chemical Adsorbents	0-95%[c]	1330 ESE	3840 NNW	1860 WSW	2960 N	1230 SE	7890 ENE
X-326 Seal Exhaust Area 6	Chemical Adsorbents	0-95%[c]	1430 E	4880 NNW	1620 SSE	4180 N	1340 E	8630 ENE
X-326 Seal Exhaust Area 5	Chemical Adsorbents	0-95%[c]	1460 E	4630 NNW	1540 WNW	3940 N	1340 E	5830 ENE
X-326 Seal Exhaust Area 4	Chemical Adsorbents	0-95%[c]	1500 ESE	4420 NNW	1460 WNW	3720 N	1340 E	8470 ENE

See notes on page 13.

Table 2.0 Point Sources, continued

Point Source[a]	Control Device	Control Efficiency	Distance in Meters to the Nearest:					
			Resident	School	Office or Business	Farm		
						Milk	Meat	Veg.
X-330 Seal Exhaust Area 3	Chemical Adsorbents	0-95%[c]	1620 E	4080 NNW	1400 W	3360 N	1430 E	8400 ENE
X-330 Seal Exhaust Area 2	Chemical Adsorbents	0-95%[c]	1725 ESE	3690 NNW	1430 WSW	3020 N	1580 SE, W	8320 ENE
X-333 Seal Exhaust Area 1	Chemical Adsorbents	0-95%[c]	1330 ESE	3840 NNW	1860 WSW	2960 N	1230 SE	7890 ENE
X-343 Cold Trap Vent	Cold Traps Chemical Adsorbents	90-95%[d] 0-95%[c]	1070 ESE	3980 NW	2130 WSW	2980 N	1040 SSE	7620 ENE
X-344A Manifold Evacuation/ Gulper	HEPA Filters	99.97%	1830 ESE	3410 NNW	1460 WSW	2680 N	1830 SSE	8320 ENE
X-344 Cold Trap Vent	Cold Traps Chemical Adsorbents	90-95%[d] 0-95%[c]	1870 ESE	3380 NNW	1440 WSW	2660 N	1860 SSE	8340 ENE
XT-847 Glove Box	HEPA Filters	99.97%	640 SSW	5840 N	980 SE	5150 N	1300 S	9150 ENE

See notes on page 13.

Table 2.1 Grouped Sources

Point Source[a]	Control Device	Control Efficiency	Distance in Meters to the Nearest:					
			Resident	School	Office or Business	Farm		
						Milk	Meat	Veg.
X-705 Calciners (3)	Wet Scrubber	75%[e]	1330 ESE	4020 NNW	1800 W	3200 N	1050 ESE	7960 ENE
X-710 Laboratory Fume Hoods (39)	None	N/A	1260 E	4690 NNW	1660 WNW	3930 N	1130 E	8350 ENE
X-705 Decontamination Facility	One area HEPA Others none	99.97% N/A	1330 ESE	4020 NNW	1800 W	3200 N	1050 ESE	7960 ENE
X-705 Storage Tank Vents	None	N/A	1330 ESE	4020 NNW	1800 W	3200 N	1050 ESE	7960 ENE
X-700 Cleaning Building	HEPA Filters	99.97%	1220 ESE	3910 NNW	1910 W	3200 N	930 E	7840 ENE
X-720 Maintenance Facility	None	N/A	1220 E	4250 NNW	1800 W	3430 N	1010 E	7880 ENE
Room Air Exhausts	None	N/A	850 ESE	3410 NNW	1370 W	2680 N	760 SE	7560 ENE

See notes on page 13.

	Notes to Tables in Section 2.0
a	All sources in Table 2.0 have continuous vent monitors except the XT-847 Glove Box.
b	The Top and Side Purge Cascade vent streams pass separately through activated alumina traps. A third line, the Emergency Jet, connects to both lines through block valves. All three lines have continuous samplers. The three vent lines connect to four exhaust pipes that extend above the 50-meter tower. The Top Purge jet is vented directly through one pipe. The Side Purge Jet and Emergency Jet lines are interconnected to the other three pipes.
c	Chemical adsorbents (such as activated alumina and sodium fluoride) are approximately 95 percent effective at concentrations above 1 ppm. Below this concentration, chemical adsorbents have reduced efficiency or no effect. Normal concentrations entering the Purge Cascade Chemical Traps are near or below 1 ppm. The sample traps (which follow the control traps) use activated alumina hydrated to 14 percent moisture content, which is much more effective due to an instantaneous reaction of gaseous UF_6 and Tc with the water to form particulate matter.
d	Based on process knowledge, cold traps are estimated to be approximately 90 to 95 percent effective in trapping gaseous UF_6.
e	Scrubber efficiency is estimated to be approximately 75 percent but has not been rigorously measured. Normal emissions from the source are estimated to be negligible compared to monitored sources (<0.001 curies of uranium).

Table 2.2 Grouping of USEC Vents for Modeling

Source	Consists of	Modeled with Source
1	X-326 Top Purge Vent, Side Purge Vent and Emergency Jet Vent	1
2	X-326 Extended Range Product emissions, SE 6 Vent, SE 5 Vent and SE 4 Vent	1
3	X-330 Building Cell Evacuation/Cold Recovery Vent, SE 3 Vent and SE 2 Vent	7
4	X-333 Low Assay Withdrawal, Cold Recovery Vent, Building Wet Air Evacuation Vent, and SE 1 Vent	7
5	X-344 Gulper Vent	5
6	All X-700 vents	7
7	All X-705 vents	7
8	All X-710 vents	1
9	All X-720 vents	7
10	XT-847 Glove Box	1
11	X-343 Cold Trap Vent	7
12	X-344 Cold Trap Vent.	5

Table 2.3 Releases (in Curies) During CY 2003

NUCLIDE	USEC Sources												
	1	2	3	4	5	6	7	8	9	10	11	12	Total
^{234}U	1.19E-05	3.10E-05	7.44E-05	1.87E-04	3.42E-06	0	8.65E-03	8.07E-03	1.07E-06	1.81E-05	9.06E-03	3.57E-04	2.64E-02
^{235}U	8.01E-06	4.23E-06	6.34E-06	1.25E-05	9.96E-07	0	2.90E-04	2.71E-04	3.59E-08	6.06E-07	4.31E-04	1.62E-05	1.04E-03
^{238}U	2.93E-06	6.12E-06	1.57E-05	6.58E-05	2.16E-06	0	7.07E-04	6.60E-04	8.74E-08	1.48E-06	9.54E-04	3.56E-04	1.14E-02
^{99}Tc	8.84E-03	2.99E-03	2.37E-03	2.76E-03	5.50E-04	0	1.94E-03	1.81E-03	0	2.81E-04	1.31E-03	9.76E-04	2.38E-02
^{228}Th	0	0	0	0	4.77E-07	0	5.06E-12	0	0	0	3.74E-07	6.05E-08	9.12E-07
^{230}Th	0	0	0	0	2.42E-06	0	1.92E-11	0	0	0	1.37E-06	7.51E-07	4.55E-06
^{231}Th	8.01E-06	4.23E-06	6.34E-06	1.25E-05	9.96E-07	0	2.90E-04	2.71E-04	3.59E-08	6.06E-07	4.31E-04	1.62E-05	1.04E-03
^{232}Th	0	0	0	0	1.04E-07	0	3.02E-13	0	0	0	4.60E-08	9.62E-09	1.59E-07
^{234}Th	2.93E-06	6.12E-06	1.57E-05	6.58E-05	2.16E-06	0	7.07E-04	6.60E-04	8.74E-08	1.48E-06	9.54E-03	3.56E-04	1.14E-02
^{234m}Pa	2.93E-06	6.12E-06	1.57E-05	6.58E-05	2.16E-06	0	7.07E-04	6.60E-04	8.74E-08	1.48E-06	9.54E-03	3.56E-04	1.14E-02

Notes:

1. Sources 6 and 9 (X-700 & X-720) do not routinely process technetium. Equipment going to these buildings is first decontaminated in X-705 to strip all removable contamination. Therefore, emissions of Tc are estimated to be zero.

2. Source 6 is not known to have processed any removable uranium during 2003. Therefore, all uranium and uranium daughter emissions from this building are estimated to be zero.

SECTION 3.0 DOSE ASSESSMENT

3.1 Description of Dose Model

The radiation dose calculations were performed using the CAP88 package of computer codes. This package contains USEPA's most recent version of the AIRDOS-EPA computer code. This program implements a steady-state, Gaussian plume, atmospheric dispersion model to calculate environmental concentrations of released radionuclides. It also includes Regulatory Guide 1.109 food chain models to calculate human exposure, both internal and external, to radionuclides deposited in the environment. The human exposure values are then used by USEPA's latest version of the DARTAB computer code to calculate radiation dose to man from the radionuclides released during the year. The dose calculations use dose conversion factors in the latest version of the RADRISK data file, which is provided by USEPA with the CAP88 package.

3.2 Summary of Input Parameters

Except for the radionuclide parameters given in Section 2.0 and those provided below, all important input parameter values used are the default values provided with the CAP88 computer codes and data bases.

Solubility Class:	All uranium isotopes:	D
	Technetium-99	D
	All uranium daughters	W
	All other thorium isotopes	W
AMAD:		1 µm
Meteorological data:		2003 data from onsite tower
Rainfall rate:		119.0 cm/year (CY 2003)
Average air temperature:		12.53 °C (CY 2003)
Average mixing layer height:		1000 meters

Fraction of foodstuffs from:	Local Area	Within 50 mi	Beyond 50 mi*
Vegetables and produce	0.700	0.300	0.000
Meat	0.442	0.558	0.000
Milk	0.399	0.601	0.000

*The dose estimate for foodstuffs is very conservative when 0.0 is used as an input parameter in the category of foodstuffs consumed that were produced at a distance of 50 miles or more from the PORTS site. Realistically, it can be assumed that very little of the foodstuffs consumed by residents within a 50-mile radius of PORTS are produced within 50 miles of the PORTS site. The majority of the foodstuffs consumed are purchased at supermarkets that receive foodstuffs from all over the world.

3.3 Source Characteristics

Table 3.0 Source Characteristics

Source	Type	Release Height (m)	Inner Diameter (m)	Gas Exit Velocity (m/s)	Gas Exit Temperature (°C)	Distance to Nearest Individual (m)	Direction to Nearest Individual
1	Point	50	0.25	18.0	35.0	1370	SE
2	Point	20	0.97	24.0	35.0	1430	E
3	Point	20	0.20	61.0	35.0	1620	E
4	Point	20	0.62	29.0	35.0	1330	ESE
5	Point	20	0.36	0.3	23.8	1830	ESE
6	Point	16	0.30	14.0	23.8	1220	ESE
7	Point	14	1.50	12.3	26.7	1330	ESE
8	Point	9	1.00	10.2	26.7	1260	E
9	Point	18	1.19	9.0	23.8	1220	E
10	Point	11	0.406	5.5	35.0	640	SSW
11	Point	33	0.076	9.3	23.8	1070	ESE
12	Point	15	0.35	0.4	23.8	1870	ESE

3.4 Compliance Assessment

In 1996, USEPA allowed USEC and DOE to submit separate reports for their areas of responsibility. However, each entity was directed to include the other's dose assessment values in its report in order to show the plant's total effect on the public.

The most exposed member of the public received an EDE of 0.033 mrem/yr (3.3×10^{-4} mSv/yr) from **USEC operations** as calculated by the CAP88 mainframe model. **DOE operations** contributed an additional 0.0066 mrem/yr (6.6×10^{-5} mSv/yr) to this individual's EDE for a total of 0.039 mrem/yr (3.1×10^{-4} mSv/yr) from **total plant operations**. This individual was located 1580 meters east-northeast of USEC's predominant emission sources (Source Group 3) and 640 meters east of DOE's predominant emission source (the X-624 Groundwater Treatment Facility). This individual was also the most exposed individual due to **DOE operations** and **total plant operations**.

SECTION 4.0 ADDITIONAL INFORMATION

4.1 Collective EDE (Person-Rem/Yr)

The Table 4.0 gives the 50-mile radius EDEs over the past ten years. The EDEs for the most exposed individual are also given for comparison. The collective EDE for persons living in the village of Piketon (~2070 persons) is 0.018 person-rem/yr.

Table 4.0 Annual Doses Due to PORTS (USEC) Airborne Emissions, 1994-2003[1]

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	EPA Std
EDE[2] (mrem/yr)	0.06	0.13	0.14	0.12	1.69	0.28	0.039	0.052	0.026	0.033	10
Collective EDE[3, 4]	0.6	1.2	2.2	1.5	6.4	1.0	0.15	0.18	0.095	0.18	N/A

Notes to Table 4.0:

1. EDE values through 1995 are for total plant operations; since 1996, figures are for USEC operations only.
2. The most exposed individual (USEC operations only) in 2003 was located 1580 meters ENE of the X-705 Decontamination Facility.
3. Collective EDE in person-rem/yr for 50-mile radius. This is a summation of the dose to each individual living within a 50-mile radius.
4. Population distributions for calendar year 2001 onward were updated from 2000 census data.

4.2 New/Modified Sources

When enrichment operations ceased in 2001, the X-343 and X-344 facilities became the sampling and packaging facilities for UF_6 enriched at the Paducah GDP. This process included filtering the liquid UF_6 through chemical absorbents ("tech traps") to remove residual ^{99}Tc.

To deal with the residual gases without an operating enrichment cascade, cold trap systems similar to those in the cascade cold recovery areas were refurbished and upgraded in both facilities. (The cold trap systems were part of the original design of both facilities, but have been out of service since the piping evacuation systems were redirected back to the cascade.) As part of the upgrades, both systems received new continuous vent samplers based on the continuous vent samplers used on other vents at PORTS. The new samplers are equipped with radiation monitors to track the accumulation of radioactive material in the sampler traps in real-time. This replaces the 1950's-style "space recorders" used for operational control of the other monitored vents at PORTS.

During 2002, the sampling and transfer of enriched UF_6 was consolidated at the Paducah GDP and the PORTS facilities dedicated to removing ^{99}Tc from contaminated UF_6 feedstock. Removal of ^{99}Tc contamination was a normal part of the sampling and transfer operation and no physical modifications were required. Technetium releases from the feedstock operation have been negligible (undetectable for the most part) and uranium activity releases have been reduced due to the lower assay being processed (less than one percent U-235 instead of up to five percent).

Since beginning the feedstock operation, however, it has become apparent that thorium and transuranics were also being collected and concentrated in the tech traps. Wipe samples of the process piping indicates that these nuclides are predominately confined to the immediate vicinity of the tech traps, but as a precaution ^{228}Th, ^{230}Th, ^{232}Th, ^{237}Np, ^{238}Pu, ^{239}Pu, ^{240}Pu, and ^{241}Am were added to the weekly analyses for the X-343 and X-344 vent samplers beginning at the end of July 2002. As of the end of 2002, no transuranic isotopes had been detected in vent emissions and those analyses have been returned to their previous frequency. Individual thorium isotopes were detected seven times (out of 150 possible detections) between July and the end of 2002 though.

The annual thorium release is several orders of magnitude less than the uranium release, but these thorium isotopes have a much higher dose response than soluble uranium. Therefore, USEC conducted an analysis of the relative releases and their dose response (based on the stochastic Annual Limiting Intake published in Appendix B to 10 CFR 20). The result indicated that the thorium isotopes would contribute less than four percent of the total public dose even if assumed emissions at the detection limit were included. This is well under the ten percent standard for inclusion under 40 CFR 61.93(b)(4)(i). The issue was discussed with Mr. Mike Murphy of USEPA and it was decided to include quantifiable thorium emissions in the site's annual dose assessment, but to exclude assumed emissions where no thorium was detected.

To reduce the volume of low level radioactive waste generated by the feedstock project, PORTS began consolidating spent technetium absorbent rather than disposing of the filters as sealed units. The spent absorbent is transferred from the filter body into a small container using a HEPA filtered vacuum. This takes place in the X-705 South Annex, which is itself HEPA filtered. The closed containers are later consolidated in 55-gallon drums for disposal. Airborne emissions from this operation during 2003 were estimated using Appendix D methods and added to the existing emission estimates for X-705. Aside from trace amounts of long-lived thorium isotopes, the additional emissions were not sufficient to change the previous emission estimates.

At the beginning of the feedstock project, X-343 primarily performed UF_6 sampling and replaced damaged UF_6 cylinder valves as needed. As the project proceeded, the number of cylinder valves that required replacement increased to the point that X-343 was dedicated to this function starting in July 2003. This operation includes a post-maintenance test that includes pressurizing the cylinder with dry air to test for leakage, then evacuating the cylinder to a specified vacuum. It was expected that radionuclide emissions from X-343 would decrease since the UF_6 is not heated at any point during this operation. In actuality, the increased gas volume of dilute UF_6 from the testing resulted in a net increase in emissions through July 2003. X-343 operations were halted and administrative controls put in place prior to resuming operations in August. Engineered controls that increased the efficiency of the cold traps replaced the administrative controls in September. Current emissions from the X-

343 Cold Trap Vent are somewhat higher than they were during the sampling operation, but are still an order of magnitude lower than traditional emissions from the Purge Cascades.

4.3 Unplanned Releases

No major unplanned releases occurred during calendar year 2003.

Minor releases occurred during attaching and detaching of lines to cylinders or when other anomalous conditions developed. The practice of as low as reasonably achievable (ALARA) is used to shut down the building ventilation system to prevent the release from reaching the atmosphere. Therefore, PORTS feels that the small releases should be considered insignificant.

SECTION 5.0 SUPPLEMENTAL INFORMATION

5.1 Radon Emissions

PORTS does not have and does not expect to have any ^{220}Rn emissions due to ^{232}U or ^{232}Th sources. PORTS does not manage any ^{232}U and consequently does not have any emissions of ^{220}Rn due to ^{232}U decay. Although PORTS does not specifically manage ^{232}Th, some amount is present due to ^{236}U decay and feedstock contamination. ^{236}U is itself a trace component of the uranium managed at PORTS, and its thorium daughter is extremely long-lived (half-life greater than 14 billion years). These figures indicate that no measurable concentrations of ^{220}Rn due to ^{232}Th decay will exist onsite within any foreseeable future.

The uranium processed at PORTS has previously been chemically purified at the mill to remove all naturally occurring elements including ^{226}Ra, which is the precursor of ^{222}Rn. It has been calculated that 10,000 years would be required before detectable levels of ^{222}Rn would occur due to the natural decay process.

5.2 Compliance with NESHAP Subpart H Requirements

During 2003, USEC had continuous emissions monitors (samplers) on fifteen point sources of the 37 point/grouped sources that represent what are historically the major emission sources at PORTS. Most of the continuously monitored point sources are not actually subject to the continuous monitoring requirement. USEC believes that all fifteen monitors comply with the requirements of 40 CFR 61.93(b) (i.e., they are equivalent to the EPA reference methods). USEPA-Region 5 conducted a detailed inspection of the vent sampling program during its NESHAP inspections during the weeks of March 15, 1993, and July 22, 1996. Although not explicitly stated in the final inspection reports, USEPA-Region 5 has accepted the stack sampling methodology. Further USEPA inspections of this program were conducted in 1994, 1995, 1998, and 2000.

The final 1993 NESHAP inspection report did not address the frequency or the methodology for periodic confirmatory measurements. USEPA has accepted engineering estimates, and USEC has made emissions estimates for all unmonitored radionuclide sources using the methods found in 40 CFR 61, Appendices D and E. Stack tests for radionuclides were made on six sources in 1989, and repeat testing was conducted on one source in 1993 as part of the process for renewal of the source's state air permit. The emissions estimates for all of the unmonitored sources were updated in 2000.

A NESHAP Compliance Plan was submitted by DOE in 1990 to document how PORTS planned to demonstrate compliance with the newly promulgated radionuclide NESHAP regulations in 40 CFR 61, Subpart H. The plan was revised and resubmitted in 1991 and 1992. USEC included continuous ambient air monitoring in its compliance plan to provide supporting evidence that no significant radionuclide emissions had been overlooked in the source monitoring program. However, USEPA-Region 5 never approved the use of ambient air monitoring to demonstrate USEC's compliance with the radiological NESHAP regulations on a continuing basis. The actions described in the plan were completed. On March 16, 1999, USEPA-Region 5 verbally agreed during a telephone conversation (POEF-520-99-038) that the compliance plan could now be considered a historical document.

PORTS has conducted an extensive stack and vent survey. Stacks with a potential to emit radionuclides have been identified and evaluated. See Attachment 1 for a listing of the radionuclide stacks/vents at PORTS.

5.3 Future Facilities

In February 2003, USEC, Inc. submitted a license application to the NRC to build and operate an American™ Centrifuge Lead Cascade at PORTS. NRC issued the license in March 2004. The Lead Cascade is to be installed in the existing X-3001 Process Building and will use the existing building vent. USEC currently plans to have the Lead Cascade in operation early in 2005.

The Lead Cascade will be a demonstration facility consisting of up to 240 individual centrifuges. The purpose of the Lead Cascade is to generate operability and economic data for a follow-on commercial centrifuge facility. The Lead Cascade will operate on full recycle with no UF_6 being withdrawn except samples for laboratory analysis. The total uranium inventory of the Lead Cascade will be only 250 kg UF6 (less than 0.125 Curies) and the maximum emission rate is predicted to be less than 0.001 Curie per week. Assuming that this emission rate was maintained for an entire year (which would shut down the cascade) the maximum predicted dose to a member of the public would still be only 0.023 mrem/yr. The Lead Cascade will have only one process vent, which will be equipped with a continuous vent monitor similar to the ones currently used on the X-343 and X-344 vents.

USEC, Inc. is now preparing an application for an NRC license for this follow-on commercial plant, to be sited adjacent to the Portsmouth Gaseous Diffusion Plant. USEC, Inc. currently plans to submit the application to the NRC in August 2004 and receive the license in 2006.

Attachment 1

PORTS 2003 Potential and Actual Radiological Emissions Point Sources

(To USEC Air Emissions Annual Report [Under Subpart H, 40 CFR 61.94] Calendar Year 2003).

STACK NUMBER	DESCRIPTION
X-326-A-512	Seal Exhaust Vent Area 4
X-326-A-540	Seal Exhaust Vent Area 6
X-326-A-528	Seal Exhaust Vent Area 5
X-326-B-284	ERP Withdrawal Room Vent
X-326-P-2798	S-Jet Exhaust - Purge Cascade
X-326-P-2799	T-Jet Exhaust - Purge Cascade
X-326-P-616	E-Jet Exhaust - Purge Cascade
X-330-A-079	Tails Withdrawal Room Exhaust
X-330-A-262	Seal Exhaust Vent Area 2
X-330-A-272	X-330 Cold Recovery/Building Wet Air Evacuation Vent
X-330-A-279	Seal Exhaust Vent Area 3
X-330-P-3020	X-330 Building Wet Air Evacuation System (Inactive)
X-333-A-832	Low Assay Withdrawal (LAW) Seal Exhaust Vent
X-333-A-851	Seal Exhaust Vent Area 1
X-333-A-852	X-333 Cold Recovery Vent
X-333-P-856	X-333 Building Wet Air Evacuation Vent
X-333-B-862	LAW Station Room Exhaust
X-342A-A-974	Autoclave Exhaust
X-343-B-1015	Exhaust Fan AJ 108
X-343-P-1011	Autoclave Air Ejector
X-343-P-468	Cold Trap Vent
X-343-P-964	Air Jet
X-343-P-997	Autoclave Housing Relief Vent
X-343-P-998	Autoclave Housing Relief Vent
X-343-P-999	Autoclave Housing Relief Vent
X-344-B-956	Room Air Over Maintenance Shops

STACK NUMBER	DESCRIPTION
X-344-P-929	Gulper Exhaust
X-344-P-469	Cold Trap Vent
X-344A-A-937	Air Ejector
X-700-A-1032	Large Parts Shot Blaster
X-700-A-1037	X-700 Rad Calibration Lab Fume Hood
X-700-A-1043	Converter Repair Station
X-700-A-1053	Small Parts Glass Blaster
X-705-A-1348	Fume Hood
X-705-A-1426	X-705 Gulper System
X-705-A-2813	Small Cylinder Cleaning Unit
X-705-B-1369	Recovery Room Vent
X-705-B-1372	Uranium Solution Storage Vent
X-705-B-1379	Dissolver Storage Columns
X-705-B-1384	Compressor Dismantling Area
X-705-B-2810	Small Cylinder Pit Hood Exhaust
X-705-B-2811	Blue Room
X-705-B-2826	Complexing Hand Table Hood
X-705-B-3091	South Annex Exhaust
X-705-P-1353	X-705 "B" Loop Storage Slabs
X-705-P-1354	X-705 "A" Loop Storage Slabs
X-705-P-1361	T-Water Storage Columns
X-705-P-1364	Bi Uranyl Nitrate Storage Column
X-705-P-1366	Heavy Metals Storage Columns
X-705-P-1375	Caustic Precipitation Handtable Exhaust
X-705-P-1377	Air Jet Recovery
X-705-P-1382	Alumina Filter Tables
X-705-P-1404	Tunnel Vent Fan
X-705-P-1406	Nitric Acid Booth

STACK NUMBER	DESCRIPTION
X-705-P-1422	X-705 Calciner Glove Box
X-705-P-1424	Uranium Sampling & Blending Glove Box
X-705-P-1950	X-705 North Spray Tank
X-705-P-1951	High Assay Parts Cleaning Tables
X-705-P-1952	Group I Hand Table
X-705-P-1953	Small Parts Pit Cleaning Area
X-705-P-1954	Handtable
X-705-P-1960	Ion Exchange Vent
X-710-B-1655	EF 101 Room 111 Lab Hood
X-710-B-1656	EF 122 Room 120 Lab Hood
X-710-B-1657	EF 102 Room 111 Lab Hood
X-710-B-1658	EF 103 Room 111 Lab Hood
X-710-B-1659	EF 123 Room 120 Lab Hood
X-710-B-1661	EF 104 Room 111 Lab Hood
X-710-B-1666	EF 124 Room 120 Lab Hood
X-710-B-1667	EF 106 Room 111 Lab Hood
X-710-B-1668	EF 107 Room 111 Lab Hood
X-710-B-1669	EF 125 Room 120 Lab Hood
X-710-B-1671	EF 108 Room 111 Lab Hood
X-710-B-1673	EF 112 Room 111 Lab Hood
X-710-B-1674	EF 109 Room 111 Lab Hood
X-710-B-1675	EF 126 Room 120 Lab Hood
X-710-B-1676	EF 110 Room 111 Lab Hood
X-710-B-1677	EF 111 Room 111 Lab Vent
X-710-B-1679	EF 127 Room 120 Lab Hood
X-710-B-1681	EF 113 Room 111 Lab Hood
X-710-B-1682	EF 128 Room 120 Lab Hood
X-710-B-1685	EF 114 Room 111 Lab Hood

STACK NUMBER	DESCRIPTION
X-710-B-1686	EF 115 Room 111 Lab Hood
X-710-B-1687	EF 129 Room 120 Lab Hood
X-710-B-1688	EF 116 Room 111 Lab Hood
X-710-B-1692	EF 6 Room 112 Room Vent
X-710-B-1693	EF 117B Room 111 Lab Hood
X-710-B-1694	EF 130 Room 120 Lab Hood
X-710-B-1696	EF 234 Room 240 Lab Hood
X-710-B-1697	EF 117A Room 111 Lab Hood
X-710-B-1698	EF 118 Room 111 Lab Hood
X-710-B-1701	EF 274 Room 240 Lab Hood
X-710-B-1703	EF 167 Room 114 Lab Hood
X-710-B-1706	EF 235 Room 240 Lab Hood
X-710-B-1707	EF 166 Room 114 Lab Hood
X-710-B-1710	EF 275 Room 241 Lab Hood
X-710-B-1711	EF 119 Room 114 Lab Hood
X-710-B-1719	EF 120 Room 115 Lab Hood
X-710-B-1724	EF 238 Room 243 Lab Hood
X-710-B-1732	EF 128 Room 115 Lab Hood
X-710-B-1733	EF 133 Room 128 Lab Hood
X-710-B-1744	EF 223 Room 229 Lab Hood
X-710-B-1747	EF 225 Room 229 Lab Hood
X-710-B-1749	EF 228 Room 229 Lab Hood
X-710-B-1750	EF 229 Room 229 Lab Hood
X-710-B-1751	EF 227 Room 229 Lab Hood
X-710-B-1753	EF 230 Room 229 Lab Hood
X-710-B-1757	EF 239 Room 243 Lab Hood
X-710-B-1758	EF 240 Room 243 Lab Hood
X-710-B-1759	EF 241 Room 243 Lab Hood

STACK NUMBER	DESCRIPTION
X-710-B-1761	EF 270 Room 238 Lab Hood
X-710-B-1779	EF 265 Room 285 Lab Hood
X-710-B-1789	EF 256 Room 263 Lab Hood
X-710-B-1803	EF 162 Room 157 Lab Hood
X-710-B-1805	EF 161 Room 142 Lab Hood
X-710-B-1808	EF 159 Room 156 Lab Hood
X-710-B-1810	EF 158 Room 156 Lab Hood
X-710-B-1811	EF 157 Room 156 Lab Hood
X-710-B-1814	EF 156 Room 156 Lab Hood
X-710-B-1821	EF 143 Room 138 Lab Hood
X-710-B-1822	EF 142 Room 138 Lab Hood
X-710-B-1823	EF 199 Room 138 Lab Hood (AA Unit, has HEPA filter)
X-710-B-1825	EF 141 Room 138 Lab Hood
X-710-B-1830	EF 140 Room 135 Lab Hood
X-710-B-1832	EF 139 Room 135 Lab Hood
X-710-B-1836	EF 138 Room 135 Lab Hood
X-710-B-1838	EF 137 Room 135 Lab Hood
X-710-B-1841	EF 136 Room 135 Lab Hood
X-710-B-1847	EF 134 Room 135 Lab Hood
X-710-B-1849	EF 135 Room 135 Lab Hood
X-720-A-1874	Grit Blasting Room
X-720-A-1545	Motor Shop Steam Cleaning Booth
X-720-A-1904	X-720 Burn Off Oven
X-720-B-1515	Sample Bottle Exhaust
XT-847-B-3102	XT-847 Glove Box

Attachment 2

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and a complete representation of the emissions under United States Enrichment Corporation's control. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment (see 18 U.S.C. 1001).

Name: **Patrick D. Musser**
General Manager

Signature: ______________________ **Date:** 6/21/04